

1 IN THE UNITED STATES DISTRICT COURT

2 DISTRICT OF UTAH

3 CENTRAL DIVISION

4
5 UNITED STATES OF AMERICA,)

6 Plaintiff,)

7 vs.) Case No. 2:16-CR-631-DAK

8 AARON MICHAEL SHAMO,)

9 Defendant.)

10 _____)

11
12 BEFORE THE HONORABLE DALE A. KIMBALL

13 -----

14 August 21, 2019

15 Jury Trial

16 Testimony of Dr. Stacey Hail

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24 REPORTED BY: Patti Walker, CSR, RPR, CP 801-364-5440

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1 SALT LAKE CITY, UTAH; WEDNESDAY, AUGUST 21, 2019; 8:30 A.M.

2 PROCEEDINGS

3 THE COURT: Good morning, ladies and gentlemen of
4 the jury. Welcome back. It occurs to me that yesterday
5 must have felt like you were back in school and had the joy
6 of unexpectedly being let out early.

7 We'll proceed.

8 MR. GADD: Your Honor, the United States calls
9 Dr. Stacey Hail.

10 THE COURT: Come forward and be sworn, please.

11 STACEY HAIL,

12 Having been duly sworn, was examined

13 and testified as follows:

14 THE CLERK: Please state your name and spell it
15 for the record.

16 THE WITNESS: Good morning. My name is
17 Dr. Stacey, it's S-t-a-c-e-y, Hail, H-a-i-l, like a
18 hailstorm.

19 THE COURT: You may proceed, Mr. Gadd.

20 MR. GADD: Thank you, sir.

21 DIRECT EXAMINATION

22 BY MR. GADD:

23 Q Good morning.

24 A Good morning.

25 Q If we could, I'm hoping this morning we could go first

1 over your background. Can you tell us where you work?

2 A Yes. I am an emergency physician and a medical
3 toxicologist. I work at Parkland Hospital in Dallas, Texas,
4 where they took JFK when he was shot.

5 Q Parkland is a particularly busy hospital, correct?

6 A Parkland is the single busiest emergency department in
7 the entire country.

8 Q When you're wearing your emergency room medicine hat,
9 can you describe for the jury what a typical day is like for
10 you.

11 A Well, in the Parkland emergency room, I'm serving as
12 attending physician. I see patients on my own, but I also
13 supervise emergency medicine residents and students. And,
14 of course, in the emergency department, we see all comers.
15 So I manage heart attacks, strokes, overdoses, traumas, you
16 name it. Anything that presents to the emergency department
17 is in my scope of practice.

18 Q This morning you've come to us from Texas, correct?

19 A Correct.

20 Q But you visited Utah recently?

21 A Yes. It's actually kind of strange to be here working
22 because most of the time when I fly into Salt Lake City,
23 it's for a vacation. And we were just here two weeks ago.
24 And we come in the winter and the summer. Utah is our
25 favorite place to come.

1 Q You mentioned teaching just a little bit. Do you, in
2 fact, hold a teaching position at the University of Texas
3 Southwestern.

4 A Yes. I am an associate professor at the University of
5 Texas Southwestern. I am a UT Southwestern employee and we
6 staff the Parkland emergency room. So kind of like Harvard
7 faculty, they staff Massachusetts General. So it's the same
8 kind of process. I'm a faculty at University of Texas
9 Southwestern, but I work out of Parkland.

10 Q And when you're teaching medical students, how much of
11 that takes place in the classroom as opposed to the
12 emergency room?

13 A Some of it takes place in the classroom, and we have
14 weekly emergency medicine conferences. But most of the time
15 in the medical setting, our teaching is at the bedside of
16 the patient.

17 Q You also work one additional place, correct?

18 A Yes. I work at the North Texas Poison Center.

19 Q When you're working for the poison center, what's a
20 typical day like?

21 A Well, the way that it works, when I take call for the
22 poison center is it is 24/7 call for an entire week. And
23 the way that that works is we have toxicology fellows in
24 training, and we take calls from all over North Texas. And
25 it's not just a mom or a dad calling the poison center

1 because their child drank bleach, or something like that.
2 We take phone calls from doctors and nurses around the
3 region that are requesting consultation for how to manage a
4 poisoned patient.

5 And every day in the poison center we have toxicology
6 rounds where we have a roundtable discussion talking about
7 patients that have been poisoned and how to manage them, and
8 we do lectures. And then we see bedside consultations at
9 Parkland, at our children's hospital, and university because
10 obviously we can't do bedside rounds at every hospital all
11 over North Texas.

12 Q We've talked a little bit about your background and
13 kind of what a typical day might be like for each of the
14 different hats that you wear. There's much more to your
15 resume, correct?

16 A Correct.

17 Q You're board certified. You're on various groups. You
18 teach. You train. All of those things, correct?

19 A Correct.

20 Q If it's okay, I want to skip ahead away from the board
21 certifications and things like that and I want to talk for a
22 minute about your work as an expert, both consulting and as
23 a witness. Have you consulted and offered opinions in cases
24 prior to this one?

25 A Yes.

1 Q Was that both as an emergency room physician and also a
2 medical toxicologist?

3 A Yes. I've provided opinions in emergency medicine
4 malpractice cases before, both on the plaintiff's side and
5 the defense side. But then also, as you can imagine, there
6 are many legal cases that involve drugs, chemicals, poisons,
7 any murder case that involves someone poisoning somebody.
8 So there are far more cases that involve toxicology poisons,
9 and I offer expertise in those as well.

10 Q In a typical case where someone has asked you to come
11 and give them an opinion, do those cases always go to trial
12 like this one?

13 A No.

14 Q But you've testified in courtrooms before, correct?

15 A Correct.

16 Q In fact, this has been kind of a busy year for you?

17 A Yes.

18 Q How many times have you testified in a courtroom this
19 spring and summer?

20 A This is my eighth trial since April 29th. It's a busy
21 opioid epidemic.

22 Q We've talked about a term medical toxicologist, and
23 could you just take a minute and explain to the jurors the
24 difference between a medical toxicologist and a toxicologist
25 Ph.D.

1 A Yes, I'm glad you asked that.

2 JUROR: Could we move this a little? Not all the
3 jury can see the witness.

4 THE COURT: Yes. Thank you.

5 BY MR. GADD:

6 Q Same question as before, could you explain the
7 difference between a medical toxicologist and a toxicologist
8 Ph.D.?

9 A That's an important question to understand because a
10 lot of people are confused that, oh, you're an emergency
11 physician, but you're also a toxicologist. We don't
12 understand how that works. But just like in internal
13 medicine, you can do a residency in internal medicine and
14 then do a fellowship in cardiology, or a fellowship in
15 pulmonology. There are actually fellowships after emergency
16 medicine, and one of those fellowships is medical
17 toxicology. And it's because, if you think about it, where
18 do most poisonings show up? If somebody overdoses, they
19 come to the emergency department. If someone gets bitten by
20 a venomous snake, they show up in the emergency department.
21 If somebody drinks a poison, they show up in the emergency
22 department.

23 So medical toxicology is part of emergency medicine,
24 and we do not work in the laboratory. I was a chemistry
25 major, but I no longer play with gas chromatographs and all

1 of the things in the laboratory anymore. I am managing
2 patients. I am a medical doctor. I treat poisoned
3 patients. My interaction is with a patient who is
4 intoxicated or poisoned, not a test tube of blood or urine.

5 A forensic toxicologist that has a Ph.D is a laboratory
6 person and their interaction with a patient is a test tube
7 of blood or urine, whereas me, the medical toxicologist,
8 interacts with the patient.

9 Q And this is along those same lines, but could you
10 explain for us just the difference between someone like
11 yourself, a medical toxicologist, and perhaps a forensic
12 pathologist?

13 A A forensic pathologist -- and the word forensic --
14 there's nothing magical about the word forensic. Forensic
15 just means that you are doing something for legal purposes.
16 So I am a toxicologist. I guess in the sense that I'm
17 sitting right here in a court means that I'm acting as a
18 forensic toxicologist in a way.

19 A pathologist is a physician that when they graduate
20 from medical school, their years of training are
21 specifically with patients that are dead. They never once
22 interact with a living patient. They interact with a body.
23 They look at tissues under the microscope. They can look at
24 blood. They can look at urine, but they never are treating
25 a patient that is alive.

1 My job as an emergency physician and a medical
2 toxicologist is to make sure that my patient doesn't get to
3 meet that pathologist.

4 Q And aside from seeing a living patient, are there other
5 things that make your specialty different from those other
6 two that I mentioned?

7 A Well, basically the same thing. My patients are
8 living. And I use a methodology when I look at dead
9 patients to figure out why someone has died. But most
10 importantly, pathologists do not have any medical toxicology
11 training. They don't take any of the rotations or the
12 coursework to learn about medical toxicology and hone in the
13 skills that is necessary to figure out which drug does what
14 kind of intoxication.

15 Q I'd like to talk about the methodology that you
16 mentioned. And I wonder if it would be helpful if you were
17 to explain for the jury, and for the rest of us, some of the
18 terms you use in your work as a medical toxicologist.

19 A Sure.

20 Q Would you be willing -- and this is kind of why we were
21 blocking your view -- would you be willing to come to our
22 whiteboard here and just walk us through some of the
23 bread-and-butter terms that you use as a medical
24 toxicologist?

25 A Sure. May I step down?

1 Q Please.

2 Please go ahead.

3 A There is a bread-and-butter term that we use in medical
4 toxicology, and this is exactly how I teach my doctors in
5 training at the poison center, and the word is toxidrome.
6 Toxidrome is toxic plus syndrome mashed together in one
7 word.

8 And if there's anything I say today, this may be the
9 one thing to remember. A toxidrome is the most important
10 term in medical toxicology. When you listen to the news,
11 you hear about celebrities that overdose, and you get the
12 sense that an overdose is an overdose is an overdose. But
13 that is not true. From a medical toxicology standpoint, I
14 spent two years learning how one kind of overdose looks
15 different from another. So the definition of a toxidrome is
16 the constellation of signs or symptoms that are unique to a
17 group of substances.

18 Q And there are several types of toxidromes, correct?

19 A There are a number of toxidromes that we learn about
20 and focus on, and the first one is sympathomimetic.

21 Q I'm glad you said it.

22 A Sympathomimetic is the toxidrome that mimics your
23 sympathetic nervous system. Your sympathetic nervous system
24 is your fight-or-flight nervous system. So drugs like
25 cocaine or meth mimic your sympathetic nervous system. They

1 rev up your fight-or-flight nervous system.

2 Q So for a patient you see in the ER who's experiencing
3 the sympathomimetic toxidrome, what does it look like? What
4 do you see?

5 A And this is very important because this is the crux of
6 medical toxicology, what does the intoxicated patient look
7 like. So the features of the sympathomimetic toxidrome are,
8 first and foremost, agitation. They are acting crazy.
9 Secondly, they have big pupils. They are very sweaty. They
10 have an elevated heart rate. They have an elevated blood
11 pressure. And then they ultimately can develop seizures and
12 cardiac arrhythmias, which is what causes death. So this is
13 a very distinct toxidrome.

14 So when I work in the emergency department and I see
15 somebody high on cocaine, or high on meth, or high on bath
16 salts -- you may have heard of those -- they are very, very
17 difficult to control, they are very agitated, and it
18 requires a number of resources, nurses and police officers
19 to hold them down because it can be very unsafe for us as
20 physicians to get close to them.

21 Q Can we talk about that, the next toxidrome that you see
22 somewhat frequently in your work in the emergency
23 department.

24 A So we're going to talk now about the opioid toxidrome,
25 and the opioid toxidrome looks much, much different from the

1 sympathomimetic toxidrome. So the opioid toxidrome involves
2 opiates and opioids.

3 Q Can you maybe, just for our benefit, can you explain
4 the difference between those two words, opiates and opioids?

5 A Right. An opiate comes directly from the poppy plant.
6 Do you remember the scene from Wizard of Oz, they're running
7 through the field of poppies, and what happens? They start
8 getting very, very sleepy. That's because a poppy is
9 papaverine somniferum, like somnolent, getting sleepy. So
10 any of the substances that come straight from the poppy are
11 opiates.

12 Now if you take one of those substances, like opium, or
13 morphine, or codeine, and you take it into a laboratory, and
14 you tinker with those molecules, those are called
15 semisynthetic opioids. Once it no longer comes from the
16 poppy itself, it is an opioid.

17 And then if you derive from scratch in a laboratory a
18 new chemical that doesn't come from the poppy at all, then
19 that is a synthetic opioid. So Fentanyl is completely
20 synthetic. It is derived completely out of the laboratory.

21 Q Thank you for explaining that.

22 When you're working in the emergency department and
23 someone comes in and they're experiencing the opioid
24 toxidrome, what sort of things do you observe?

25 A So the way that an opioid toxic patient looks is they

1 have pinpoint pupils. This is a very dramatic finding. So
2 when someone comes -- we're all used to seeing our pupils as
3 a normal size and depending on how much light is let in.
4 But an opioid toxic patient, their pupils are so tiny, you
5 almost can't see their pupils at all. It's actually pretty
6 strange.

7 The other finding is central nervous system -- I'm
8 abbreviating that, CNS -- depression. So this is your
9 brain, and that involves looking sleepy to being completely
10 unconscious.

11 The third finding in the opioid toxidrome is
12 respiratory depression. This basically means that you
13 breathe slower and slower until you develop what we call
14 apnea, which is when you stop breathing, and that is how you
15 die. So opioid toxic patients go to sleep and die.

16 Sympathomimetic patients are agitated, acting crazy,
17 and have a sudden cardiac arrest. This happens over a
18 little bit more time.

19 Q You talked a bit about respiratory depression, and I
20 wanted to ask you a question about a phrase in your report
21 agonal breathing. Could you kind of explain where that fits
22 in?

23 A So the thing that happens in any patient who is
24 unconscious, for whatever reason, whether it's head trauma
25 or unconsciousness from an opioid, is you no longer protect

1 your airway. When we are awake every day, we hold our
2 airway open. We don't think about it, but we do. Then
3 there's some people at night, when they get sleepy and
4 they're sleeping deep, they start snoring. That's because
5 they're kind of unconscious, they're not protecting their
6 airway, and you develop an obstructive breathing pattern.
7 So the tissue collapses on itself, and as you're breathing
8 past it, it makes a noise.

9 And so my husband is one of these people that does
10 this. And what happens when he starts snoring at night, you
11 give him a kick, he wakes up a little bit, he opens up that
12 obstruction, and he stops snoring.

13 Now let me make this clear. This is not actually
14 snoring. It sounds like snoring, but it's much worse. The
15 airway collapses on itself and it creates obstruction. And
16 so the opioid toxic patient has to breathe past that
17 obstruction, and so it makes a sound that we call agonal
18 breathing. Agonal does not mean in agony necessarily. It's
19 just a style of breathing from the brain. Laypeople,
20 inevitably, whenever they're around an opioid toxic patient,
21 will describe it as snoring.

22 Q Snoring, heavy snoring, things like that?

23 A Can you get a little closer to the mike?

24 Q Sorry.

25 A Thanks.

1 Q Do they describe it as snoring, heavy snoring, loud
2 snoring? Do you hear things like that?

3 A Yeah, anything to describe -- because I've never seen a
4 layperson say, oh, yes, they were agonally breathing. What
5 it sounds like is snoring to the layperson.

6 Q After a person stops breathing, how soon after does
7 death occur?

8 A Say that again.

9 Q After a person stops breathing, how soon after does
10 death occur?

11 A Well, what happens as an opioid toxic patient's
12 breathing gets slower and slower and there is obstruction
13 that occurs, this is a death that happens over minutes to
14 hours. Now there are some opioids that are so potent that
15 it can be more rapid. It depends on the potency and the
16 dose that was taken.

17 But as we were talking about the obstruction that
18 happens, what's important about this obstruction is it
19 requires a lot of pressure to breathe past it. So if you
20 try this, if you plug your nose and close your mouth and try
21 to take a breath, you're going to feel a sensation inside of
22 your chest trying to overcome that 100 percent obstruction,
23 and that's negative pressure in your lungs. What that does
24 is it draws fluid into the lungs, and this is pulmonary
25 edema.

1 So, inevitably, in almost any opioid death I see, there
2 is pulmonary edema. This is fluid. It's drawn out of the
3 capillaries in the lungs. And it's bloody. And it could be
4 pink tinged. Sometimes it's very foamy looking, but it is
5 fluid in the lungs, and this is because death has taken some
6 time to develop as they are breathing past that obstruction
7 and slower and slower over time.

8 So pulmonary edema is not part of the toxidrome per se,
9 but it is a consequence of the toxidrome, and that is what I
10 see invariably in all pulmonary -- in all opioid toxic
11 deaths.

12 Q With the rise of Fentanyl use, what are you seeing as
13 an emergency room physician?

14 A Fentanyl is a very potent opioid. And just to express
15 how potent, we assign morphine that you take by mouth, which
16 in medicine by mouth is abbreviated PO. So PO morphine gets
17 a label one. Heroin, depending on how you use it, maybe
18 like 1.5 to three oxycodone, maybe 1.5 to five, just
19 depending on how you use the drug, if you crush it versus
20 inject it. So those are some examples of the potency.

21 Fentanyl, we assign the number 100. So Fentanyl is 100
22 times more potent than PO morphine. So in these
23 circumstances, we see this central nervous system depression
24 happen pretty quickly with Fentanyl. They slump over
25 wherever they are. With all of the heroin deaths I've seen,

1 they have time to get comfortable in their recliner or get
2 comfortable in bed and go to sleep. But a lot of times in
3 these Fentanyl overdoses, they may be slumped over in the
4 bathroom stall at McDonald's. That's how fast sometimes the
5 central nervous system depression can occur. But this
6 respiratory depression takes longer and that's why we still
7 see the pulmonary edema. We see it in living patients that
8 live to come to the emergency. And we are also requiring
9 higher doses of Narcan to get these people back.

10 Q Do you just want to take a minute and explain what
11 Narcan is?

12 A Narcan is the antidote for opioid toxicity. Narcan is
13 the trade name. Naloxone is the generic name. And you can
14 give Narcan up the nose. You can put it down an
15 intratracheal tube if the patient is intubated. Most of the
16 time we inject it. And what happens is within seconds, it
17 specifically reverses the central nervous depression and
18 respiratory depression from an opioid.

19 Narcan does not reverse cocaine. Narcan does not
20 reverse Xanax. Narcan does not reverse anything other than
21 an opioid. And what's important is once the patient is
22 already dead, Narcan does not have the Lazarus effect. It
23 does not raise the patient from the dead.

24 Q For a patient who's built up some tolerance to opioids,
25 how does that tolerance affect the timing of the central

1 nervous system depression, the respiratory depression, and
2 ultimate death?

3 A When tolerances happen in an addict of some kind, it
4 takes larger doses to get the effect they used to have, and
5 it can take longer for these symptoms to display themselves.

6 Q There are other toxidromes you use in your work,
7 correct?

8 A Correct.

9 Q I wonder if there's just maybe one more we could talk
10 about this morning. Could you talk about the sedative
11 hypnotic toxidrome?

12 A The sedative hypnotic toxidrome is what we see with
13 people that overdose on sedatives.

14 Now in the 1960s, there were very toxicologically
15 interesting sedatives. Marilyn Monroe died from Nembutal,
16 which is a barbiturate. Elvis Presley died from Placidyl,
17 or eth clyro vinyl, which is a sedative. These kinds of
18 sedatives have respiratory depression associated with them.
19 But somewhere along the way, we have gotten better with
20 designing our antianxiety agents and our other types of
21 antidepressants.

22 So nowadays, when we're talking about benzodiazepines,
23 things like Xanax, or Valium, even in massive overdose,
24 which I see all the time, people coming in after taking an
25 entire bottle of Xanax, they have CNS depression. But the

1 important thing is they do not have respiratory depression.

2 Now because these are sedatives and they cause you to
3 relax, when you are relaxed, you do breathe a little slower,
4 okay. But that's not what I'm talking about. Respiratory
5 depression is a very significant finding in opioid overdoses
6 because it works at certain receptors in the brain to cause
7 you to slow your breathing and stop breathing. Just by
8 virtue of relaxing and breathing slower is not respiratory
9 depression. So there is not significant respiratory
10 depression with sedative hypnotics like benzodiazepine.

11 I'm also going to put alcohol into this category
12 Because alcohol also works at the same receptors that we're
13 talking about in this toxidrome. So even though somebody
14 can drink a ton of alcohol and get drunk as a skunk, they
15 may be passed out, they do not have the respiratory
16 depression associated with it like you see with opioids.

17 And think about it. The only time that we really hear
18 about people that die from alcohol poisoning are college
19 kids playing drinking games. And it's so rare and
20 significant it makes the news, and that's because they have
21 gone into this stratosphere with their alcohol level. But
22 most drinking, including heavy drinking, does not cause
23 respiratory depression.

24 Q This may be a good point if you want to resume the
25 stand. I want to ask you some additional questions about

1 how you treat patients in the emergency room. And thank you
2 for explaining that.

3 What you've just taught us isn't just academic,
4 right?

5 A No.

6 Q Do you live and breathe this?

7 A Yes. This is everyday emergency medicine and medical
8 toxicology in every emergency department across the entire
9 country.

10 Q So if you're in the emergency department and you have a
11 heroin overdose come in and they're barely breathing, do you
12 base your treatment on numbers?

13 A No, and that would be ridiculous. Imagine a patient
14 coming in who has pinpoint pupils, who is unconscious and
15 barely breathing, and my colleagues and I sit around and go,
16 oh, we must get that heroin level back to decide what we're
17 going to do with this patient.

18 First of all, it would take a while to get that level
19 back. Secondly, the patient would be dead by the time we
20 got that level back, and even when we get that level back, I
21 wouldn't know what it means because it's different in
22 everybody. There are wide ranges that cause toxicity,
23 depending on sex, and genetics, and tolerance, and other
24 issues. So never do we say let's get this level and see
25 what to do in a patient like that. We would give Narcan.

1 We treat the patient, not a number.

2 Q And when we talk about levels, blood levels, drug
3 levels, what is it specifically that you refer to that
4 you're not using in that setting?

5 A We are not using what would be called a lethal level.
6 And normally -- and I apologize because a lot of times when
7 I tell lawyers this, it's like I'm telling them there's no
8 such thing as Santa Claus. As toxicologists, we don't care
9 about the number in these circumstances and there is no
10 defined lethal level, not to be mixed up with the lethal
11 dose. There is definitely a dose that somebody can take
12 that can be lethal. But we're talking about concentrations
13 in the body. When we're talking about opioids, when we're
14 talking about cocaine metabolite, most drugs that we talk
15 about, we are not looking at the number. It does not mean
16 very much in living patients and it means even less in dead
17 patients.

18 Q For that same scenario where you're working in the
19 emergency department and a heroin overdose comes in and
20 they're barely breathing, do you try to gather information
21 not just what you see but also about kind of their history?

22 A Right. Certainly if we see a patient that has pinpoint
23 pupils, unconscious and barely breathing, we are managing
24 that patient, giving them Narcan, supporting their airway.
25 But we're also gathering data from the EMS personnel that

1 come in, by family that may come in, and that is part of
2 getting the history as we do in all kinds of emergency
3 patients.

4 Q Let's turn our attention to the reason we've asked you
5 to come here, the death of Ruslan Kluyev. Were you asked to
6 review his death?

7 A Yes.

8 Q Are you familiar with the but for cause standard?

9 A Yes, I am.

10 Q Did you reach a conclusion as to the but for cause of
11 Ruslan's death?

12 A Yes. Ruslan would not have died but for the Fentanyl.

13 Q Can you walk us through your methodology for reaching
14 that conclusion?

15 A Yeah. As I stated previously, I'm aware of a but for
16 cause of death standard and cause of death opinions in
17 federal court. And what that means is that you have to come
18 up with an opinion that this person would not have died but
19 for a certain reason.

20 And I am a medical toxicologist, but I am not stuck in
21 a toxicology tunnel vision. Because I'm an emergency
22 physician and I see patients that suffer from trauma, I
23 first look for any reason to believe that somebody died from
24 trauma, and I need to rule out trauma. And in this case, I
25 ruled out trauma.

1 The next thing is to rule out natural causes of death,
2 things that cause sudden death. So cancer is not a sudden
3 death. That's a long death. Looking for things that would
4 cause sudden death, like a heart attack, or a stroke, or a
5 pulmonary embolism, something along those lines, and rule
6 out natural causes of death.

7 Then I turn my attention to the toxicology. So when I
8 am coming up with a but for cause of death, I'm not having
9 tunnel vision. I am looking for all the different reasons
10 that somebody could experience sudden death.

11 Q And as part of your research for this case, did you
12 review the police reports?

13 A Yes.

14 Q Did you review the autopsy report?

15 A Yes.

16 Q And the findings of the medical examiner's office?

17 A Yes.

18 Q The toxicology results that were included in them?

19 A Yes.

20 Q Did you review witness statements?

21 A Yes.

22 Q Photos from the scene of the death?

23 A Yes.

24 Q Let's talk through some of those things. First if we
25 could talk about the autopsy. Did you specifically review

1 the report written by the autopsy surgeon, Dr. Thomas
2 Rogers?

3 A Yes.

4 Q What did the autopsy reveal?

5 A The autopsy revealed that there were no signs of
6 trauma, there were no signs of sudden death from natural
7 causes, and ultimately the cause of death was mixed drug
8 intoxication.

9 Q Let's talk for a minute about the toxicology results.

10 MR. GADD: Ms. Louder, if we could look at 18.02.

11 BY MR. GADD:

12 Q While that's popping up on your screen, did you review
13 the toxicology results from Mr. Kluyev's blood that was
14 taken during the autopsy?

15 A Yes.

16 Q If we could zoom in on that same section we were
17 looking at yesterday, could we go line by line through these
18 results?

19 A Yes.

20 Q What's blood ethyl alcohol?

21 A Ethyl alcohol is ethanol or just alcohol, and this
22 would be from the vodka that he was reportedly drinking the
23 night of his death.

24 Q As long as we're on this topic, in your report there's
25 a missing number one, correct?

1 A Correct.

2 Q So with that correction, the additional number one, can
3 you tell us how many standard alcoholic beverages that this
4 blood alcohol concentration would equate to?

5 A Yes. So with the caveat that alcohol concentrations
6 are very handwavy, I have consulted on a number of DWI cases
7 and a number of what are called dram shop cases, that any
8 kind of alcohol calculations are not as exact as I wish they
9 would be. And so when I say this, with the caveat that this
10 is a handwavy calculation.

11 So .19 is approximately 12.5 standard alcoholic
12 beverages in this case, mainly because I'm taking about a
13 three-hour time frame where I don't think he was drinking,
14 which is once he used the Fentanyl and he was placed in the
15 fetal position for three hours, and so you metabolize off
16 three drinks. So I add that back in. So it is at least
17 12.5 alcoholic beverages. In my report I accidentally left
18 the one off and put 2.5. It is 12.5.

19 Q You've talked to us about how you treat living
20 patients. Do you have people come into the ER who are at
21 .19?

22 A Oh, absolutely. Whereas this seems like an impressive
23 number, and it is, I'm not advocating for heavy drinking,
24 but I think a lot of people have a sense -- you said in Utah
25 it's .05 to drive, correct?

1 Q Yeah.

2 A So in Utah. In other places, it's .08. It's not like
3 you are not intoxicated at all at .049 and then you
4 magically become intoxicated at .05. I think studies show
5 there's an impairment even lower than .05. But the point is
6 how somebody deals with this intoxication, how they show it.
7 It looks different based on somebody's tolerance. And I'm
8 not saying that that means that they can drive above .05 or
9 above .08. The point is is how they demonstrate signs of
10 intoxication. And so somebody coming into the emergency
11 department with .19 could look very normal to an emergency
12 physician.

13 We play a game in the ER, guess the drug guy's alcohol
14 level, and we don't do very well with that. And that's
15 because my record is .534. So not .0534, .534. And not
16 only was this guy not acting intoxicated, he was actually
17 withdrawing.

18 We see every day in the emergency department numbers in
19 the 300s, the 200s. So this is definitely a high level, but
20 this is not a level that would at all be something to be
21 concerned about causing death.

22 Q .534?

23 A Yes.

24 Q That's two and a half times what we see here, right?

25 A Right.

1 Q And your patient was alive?

2 A Yes.

3 Q Let's look at the next one down, cocaine. I suppose
4 that one doesn't have to be defined, but could you maybe
5 take the next one down that I don't dare try to pronounce.

6 A So that's benzoylecgonine, or BE is how we
7 traditionally abbreviate it.

8 Cocaine is a pretty fast acting drug, and it oftentimes
9 gets metabolized to these other things that we see here. So
10 the BE. The ecgonine methyl ester is EME. And cocaethylene
11 is when cocaine combines with ethanol. So these are all
12 metabolites of cocaine.

13 Cocaine is what is active. These other metabolites are
14 not as active. So the fact that cocaine has already come
15 and gone says a lot about where he was in the midst of his
16 intoxication. But frequently cocaine is metabolized very
17 quickly.

18 Q So if we're talking now about cocaine and the
19 sympathomimetic toxidrome, would you expect to see -- for
20 someone experiencing those signs and symptoms, you know, the
21 agitation, the sweatiness, the big pupils, the elevated
22 heart rate, maybe it was a case where it was, you know, a
23 sudden death when they were arrested by the police,
24 something like that, would you expect to get results back
25 and see cocaine was negative?

1 A No. In someone who is acutely intoxicated like that,
2 we would expect to see the cocaine to be -- the cocaine
3 cocaine to be present.

4 Q Every body is a little different, but let me see if I
5 can ask it this way. How fast does an average living body
6 metabolize cocaine?

7 A Well, of course, that's an impossible question to
8 answer because it always depends on the dose. The saying in
9 toxicology, the dose makes the poison. And drug dealers
10 don't have very good quality control, so we never really
11 know what dose is actually being taken. So I don't think
12 anybody could really answer that question. But overall,
13 cocaine gets metabolized very quickly.

14 Q Is it faster or slower -- other things being equal in
15 terms of, you know, purity and things like that, is it
16 faster or slower than the metabolization rate for heroin?

17 A So heroin, believe it or not, is the trade name for
18 diacetylmorphine. Diacetylmorphine was discovered or
19 invented in the late 1800s by Bayer Pharmaceuticals, the
20 same people that make aspirin, so Bayer aspirin. They were
21 the ones that named heroin heroin. So heroin is the trade
22 name for diacetylmorphine. Diacetylmorphine has a very
23 fleeting half life. I have never once, ever, ever, ever,
24 seen diacetylmorphine in a dead body. Because it's so fast,
25 it gets metabolized very quickly.

1 There is a metabolite called 6-monoacetylmorphine, or
2 6-MAM is how it's abbreviated. That's not around too long
3 either, but you generally can find it in urine or -- not
4 necessarily the blood. And then most of the time in heroin
5 deaths, we see just morphine because that's what it gets
6 metabolized to. So cocaine gets metabolized pretty quickly,
7 but I still see cocaine postmortem. I have never seen
8 diacetylmorphine as a molecule postmortem.

9 Q I think you mentioned this, but I wanted to kind of
10 drill down on it. So how does the physiological effect of a
11 cocaine metabolite, such as BE or EME, how does that differ
12 from the physiological effect of cocaine?

13 A These metabolites are not as active as cocaine.
14 Cocaine is what causes this sympathomimetic toxidrome.

15 Q We've talked about cocaethylene. Could we take the
16 next one down that starts with an L.

17 A Levamisole is a drug that is for worms, and this is not
18 FDA approved in the United States. It is used in like
19 Mexico and South America to treat different kinds of
20 parasitic infections, and for some reason it's been used to
21 cut cocaine.

22 Q You see this with some frequency, correct?

23 A I've seen it a number of times. I don't know why they
24 use it to cut cocaine because I don't think it adds anything
25 to the high. It's probably just readily available, but it

1 doesn't really have any effects that cause toxicity except
2 for chronic toxicity. Like someone who is taking it for a
3 long-term parasitic infection will develop a decline in
4 their white blood cell count, so they are unavailable to
5 fight infections as well. But that's a chronic issue with
6 people that are taking it as prescribed.

7 Q So we've talked now about cocaine metabolite and this
8 cocaine cutting agent. Do you have an opinion as to whether
9 the cocaine metabolite or the cocaine cutting agent killed
10 Ruslan Kluyev?

11 A The cocaine nor any of the metabolites caused or
12 contributed to his death. They did not cause or contribute
13 to his death.

14 Q Let's take the bottom row, then, Fentanyl. We talked
15 about it briefly. Can you maybe just explain to the jury
16 what exactly Fentanyl is?

17 A Fentanyl is 100 times more potent than PO morphine. It
18 is a synthetic opioid, and it has traditionally been used in
19 medicine for cancer pain, like Fentanyl patches. And as an
20 emergency physician, whenever I do procedures, I give
21 Fentanyl all the time for reducing fractures, or putting a
22 shoulder back in place. We use Fentanyl for pain. We give
23 it intravenously. Little kids will be given Fentanyl
24 lollipops in the ER for pain control. So Fentanyl has been
25 traditionally used in medicine for treating pain.

1 Unfortunately, over the last several years, Fentanyl
2 has found its way into the illegal drug market, and because
3 it's much more potent than heroin ever was, we are seeing
4 deaths across the entire country.

5 Q If Fentanyl is that dangerous, in your experience, why
6 do people risk using it?

7 A In many circumstances, they don't even know that
8 Fentanyl is present. It may be Fentanyl tainted heroin, or
9 it may just be that heroin is completely replaced by
10 Fentanyl, or it may be in these counterfeit pills and they
11 don't know. However, for individuals that do know that it's
12 Fentanyl, they are doing what's called chasing the dragon.

13 Q Can you explain that term?

14 A When somebody uses an opioid for the first time, they
15 develop euphoria. Euphoria is what brings them back for
16 more every time. However, as time goes on, the brain
17 chemistry changes and they will never find that euphoria
18 again, but they don't give up trying. They want to find it
19 and they'll use bigger doses of the same drug, or they will
20 seek out other drugs that are more potent to try to find
21 that euphoria. So that is called chasing the dragon. They
22 are always looking for that high that they had the first
23 time.

24 Q When we look at the toxicology results, next to
25 Fentanyl on the right side of the screen, there's a drug

1 level reported. Is there any significance in that level to
2 you as a medical toxicologist?

3 A No. The significance is that it is not a false
4 positive. Whenever I see a quantitative result, meaning
5 that there is a number or a concentration, that means that
6 it is no chance for a false positive. When you see results
7 like present or positive, that is a qualitative result.
8 There is always a chance that it could be a false positive.
9 But when you see a concentration, it is definitely that this
10 Fentanyl is present. It is not cross-reacting with
11 something. But the number in and of itself is there's no
12 defined lethal level.

13 MR. GADD: Could we zoom out for a minute.

14 So just above the two signatures, this kind of
15 standard report from Central Valley Toxicology, could you
16 zoom in. Do you see where it says blood Fentanyl, and
17 ranges, and effective, and potentially toxic? So down that
18 next grouping.

19 BY MR. GADD:

20 Q When you say to the jury there's no set defined level,
21 that's a reference to something like this that might show up
22 in a report, correct?

23 A Correct.

24 Q There's no intellectual honesty or dishonesty from a
25 toxicologist who has this just in the standard kind of form

1 report, right?

2 A There are a couple of things that involve why these
3 ranges need to be looked at with a grain of salt. Number
4 one, a lot of times on these toxicology reports, they are
5 reporting ranges in living patients. So these are
6 antemortem levels. You can't compare an antemortem drug
7 level to a postmortem drug level. It's apples and oranges.
8 So it's not appropriate to say our postmortem level is
9 .0009, or whatever, and we're comparing it to this range
10 that's listed here because that range could be for living
11 patients, and there is no defined lethal level as I said
12 before.

13 Q Could we take a minute and talk about reports and
14 witness statements that you reviewed in researching your
15 conclusion?

16 A Yes.

17 Q Did you specifically read the police reports created in
18 Daly City that dealt with the death scene, and the
19 interviews, and things of that nature?

20 A Yes.

21 Q Did you learn in those reports that two witnesses
22 watched Ruslan crush and snort two Fentanyl pills prior to
23 laying down in his bed on the night of his death?

24 A Yes. Their testimony was that he had crushed these
25 pills with a yellow battery and snorted it through a rolled

1 up blue Post-it note.

2 Q Do you know whether the physiological effect would
3 change if someone were to crush up a fake pill containing
4 Fentanyl and snort it versus if they were to ingest the fake
5 pill containing Fentanyl?

6 A So anytime you crush up any pill, it's a pretty
7 dangerous practice, whether it's pharmaceutical or fake.
8 Basically what you're doing is getting a bolus, or an all at
9 once dose through your nose, which you absorb things through
10 your nose very quickly, which is why people do that. If you
11 take a pill by mouth, it's going to take some time to
12 digest.

13 The other thing is there are a lot of pills, depending
14 on the engineering of the matrix that the pill is made, some
15 of them are designed to slowly release drug over time, and
16 if you crush that up, you've completely destroyed that
17 matrix and you're getting the whole dose all at one time.
18 So whether it's designed to be trickling into your blood
19 system over time or meant to just take as a pill, whenever
20 you crush up any pill and snort it, it's dangerous.

21 Q You've referred to pills that are designed for kind of
22 an extended release effect, correct?

23 A Correct.

24 Q Those are made by pharmaceutical companies?

25 A Yes.

1 Q Do you know if it takes a fair amount of sophistication
2 to make a pill that has an extended release?

3 A I would think so.

4 Q Let's talk for a moment about pictures at the scene of
5 Ruslan's death.

6 MR. GADD: Could we look at 1801, page six.

7 BY MR. GADD:

8 Q Can you see that on your screen?

9 A Yes.

10 Q Is this one of the pictures that you considered?

11 A Yes.

12 Q What stands out to you when you look at this?

13 A There are fluids on the bedcovers there. And
14 oftentimes in opioid overdoses, we will see something called
15 a foam cone. Now you remember we talked about pulmonary
16 edema earlier as a consequence of an opioid overdose or an
17 opioid toxicity. That pulmonary edema will come out the
18 airway, so that means it will come out the mouth and nose,
19 and because it is mixing with air, it looks very foamy.
20 Like I guess the milk on a cappuccino, they put air through
21 it. So whenever you put air through a fluid, it's going to
22 get foamy.

23 Because he was placed in a fetal position instead of on
24 his back, you wouldn't have seen the foam cone because that
25 fluid would have just poured out. So what you see on this

1 bed is blood tinged pulmonary edema.

2 MR. GADD: Could we look at page seven.

3 BY MR. GADD:

4 Q Is this also a picture that you considered when you
5 were coming to your conclusion?

6 A Yes. This was after he was moved off of the bed onto
7 the floor, and because of rigor mortis, he was still in the
8 fetal position that he had been placed in.

9 Q There's an additional picture I'd like to show you that
10 we're not publishing out of respect to the victim, and once
11 I show you, I'd like to ask you some questions about it.

12 Do you recognize that picture?

13 A Yes.

14 Q Is that a picture that you relied on when you were
15 forming your conclusion?

16 A Yes.

17 Q What, when you look at that picture -- maybe we should
18 take it in two steps. Could you describe for the jurors
19 what you see in that picture?

20 A This picture is of his face, and it has a great deal of
21 secretions, blood tinged fluid, mucus, material all over his
22 face. And this is a combination of any material that could
23 have been in his stomach that could have come out, but it is
24 also the pulmonary edema as it emanates out of the body as
25 he's dying and once he's dead.

1 Q Would you ever expect to see a pulmonary edema with a
2 cocaine overdose?

3 A Not so much because with cocaine you have someone who
4 is very agitated and they have a sudden cardiac arrest.
5 That is something very quick so there is not time for
6 pulmonary edema to develop. Whereas in an opioid death, as
7 they breathe slower and slower and slower over time and then
8 they stop breathing, the heart is still beating for, you
9 know, some length of time after you stop breathing. So this
10 is a death that takes place over time, and that's why we see
11 pulmonary edema and other secretions in these opioid cases
12 as opposed to somebody who drops dead in police custody or
13 drops dead due to cocaine.

14 Q When you were telling the jury your conclusion, you
15 used the phrase but for. Can you just circle back with me
16 and describe what but for causation means in a case like
17 this?

18 A Yes. In the circumstance, the medical examiner called
19 the cause of death mixed drug intoxication, and I find that
20 to be a very intellectually honest cause of death. I
21 believe that medical examiners should say that and list out
22 all the drugs that are found postmortem because, number one,
23 they may not necessarily know all of the evidence and all of
24 the perimortem circumstances. That word perimortem
25 circumstances is very important because that's what paints

1 the picture of the toxidromes.

2 They may not have that information when they are coming
3 up with a cause of death, so they call it mixed drug
4 intoxication, which I am absolutely fine with because they
5 have not been trained in medical toxicology.

6 My job as a medical toxicologist is to review all of
7 the information and determine what were the perimortem
8 circumstances. What did somebody look like as they were
9 dying. And from that information and the evidence provided,
10 everything that I reviewed, I come up with the but for cause
11 of death, if I can, and that is, specifically in this case,
12 that Ruslan would not have died but for the Fentanyl.

13 Q You give opinions in a fair number of cases. People
14 reach out to you seeking your opinion, correct?

15 A Correct.

16 Q For instances like this where the question is whether
17 or not a drug was a but for cause of death, approximately
18 what percentage of the time are you able to find a but for
19 cause?

20 A Approximately 50/50. I obviously review a lot of cases
21 for the Department of Justice, and part of that is because
22 there are actually fewer than 300 board certified medical
23 toxicologists in the country. So we are actually a pretty
24 rare commodity compared to the number of drug cases. There
25 are very few of us that are medical toxicologists and even

1 fewer that even like talking to you lawyers. So I get a lot
2 of calls from the Department of Justice.

3 When the Department of Justice asks me to look for a
4 but for cause of death, probably 50 percent of the time I
5 tell them that this case does not have all the evidence to
6 meet that but for standard.

7 Q I believe you recently testified at a sentencing in one
8 of those very cases, right, where you could not make that
9 conclusion?

10 A Correct. When I am reviewing a case and there may be a
11 hole in the evidence, or some missing pieces of information,
12 or what I would call a fly in the ointment to make a but for
13 cause of death, the benefit of the doubt goes to the
14 defendant, and I will not meet that but for cause of death
15 standard.

16 A couple weeks ago I went to West Virginia, which is
17 the ground zero of the opioid epidemic for a number of
18 reasons, and didn't testify in a trial but testified in a
19 sentencing hearing about the fact that it was not but for,
20 but more likely than not.

21 MR. GADD: If I could have just one moment?

22 THE COURT: Yes.

23 MR. GADD: Nothing further. Thank you.

24 THE COURT: Ms. Beckett, you may cross-examine.

25 //

1 CROSS-EXAMINATION

2 BY MS. BECKETT:

3 Q Dr. Hail, you're being paid for your testimony today,
4 correct?

5 A Correct.

6 Q What's your hourly rate?

7 A I believe in this case it's 550 an hour.

8 Q And who's paying that?

9 A The Department of Justice.

10 Q Do you have any federal government contracts?

11 A Yes.

12 Q How many federal government contracts do you have?

13 A I'm not sure. A lot.

14 Q More than ten?

15 A Uh-huh, yes.

16 Q More than 20?

17 A Probably.

18 Q Over the course of your career, more than 50?

19 A Probably.

20 Q How often in a criminal case have you testified on
21 behalf of a defendant?

22 A In a federal court case of this nature none.

23 Q Never?

24 A Correct. I do consult with defense attorneys around
25 the country, but none of those cases have ever gone to

1 trial.

2 Q I believe Mr. Gadd just asked you how many times -- or
3 he discussed briefly that there have been times where you
4 have not found a but for cause. Would that be a correct
5 recitation of what just occurred?

6 A Right. Approximately 50 percent of the time.

7 Q And you can't put a number on how many times you
8 haven't found a but for cause?

9 A Well, I have been reviewing cases related to opioid
10 epidemic issues with the federal government since 2008, and
11 sometimes these contracts are a quick one hour of my time to
12 say no, this does not meet but for, and sometimes they are
13 larger engagements with more complicated cases. And
14 sometimes one doctor case may have 25 deaths out of their
15 practice.

16 So I have reviewed hundreds and hundreds of opioid
17 deaths over the last decade, and I obviously have not kept
18 tabs on exactly how many, but it is about half the time I
19 say it meets but for and half the time that it does not.

20 Q So the answer is no, you don't know how many times
21 you've testified that --

22 A I can't give you an exact number.

23 Q How many times have you found a but for cause?

24 A I don't know the exact number. But like I said, I've
25 reviewed hundreds of cases and about half the time it meets

1 the but for standard. And even amongst those cases, they
2 don't always go to trial.

3 Q I believe you testified that what makes you unique and
4 qualified to testify is that you have a lot of hands-on
5 experience with patients, correct?

6 A Correct.

7 Q Hands-on experience with the opioid epidemic --

8 A Yes.

9 Q -- in an emergency medical setting, correct?

10 A Correct.

11 Q Did you touch a victim in this case?

12 A No.

13 Q Examine a body?

14 A No.

15 Q Examine blood?

16 A No.

17 Q Examine any organs?

18 A No.

19 Q Touch anything other than a report?

20 A No.

21 Q I believe your report and the report of the medical
22 examiner, or pathologist in this case, mentions pulmonary
23 edema; is that correct?

24 A Correct.

25 Q I believe you went over this a little bit, but if you

1 could, just explain briefly what pulmonary edema is.

2 A Pulmonary edema is fluid that leaks out of the
3 capillaries and can be present in the lungs. We've already
4 talked about that.

5 Q I believe you testified that part of pulmonary edema
6 comes from that negative pressure in the lungs; is that
7 correct?

8 A Correct. As an opioid toxic patient is breathing
9 slower and against an obstruction, they have to work hard to
10 work against that obstruction, and it creates negative
11 pressure in the lungs that draws fluid into the lungs.

12 Q But it can be any kind of obstruction that can create
13 pulmonary edema, correct?

14 A Not necessarily. I mean if somebody is choking, they
15 could potentially have obstruction that causes pulmonary
16 edema. I haven't ever seen that before. But typically we
17 see this kind of pulmonary edema related to negative
18 pressure from the way that the patient is breathing as they
19 die.

20 Q If somebody aspirates vomit into their lungs, could
21 that create an obstruction that then leads to pulmonary
22 edema?

23 A That's not the same kind of obstruction. Aspiration is
24 something that goes into the airways and it can cause an
25 inflammatory response. But unless there is some massive

1 food particle that is obstructing an airway, it is not the
2 same kind of obstruction.

3 Q If someone has apnea and aspirates vomit into their
4 airway, could that cause pulmonary edema?

5 A No. Aspiration in the lungs is not pulmonary edema.

6 Q That was not my question.

7 If somebody has apnea and aspirates vomit into their
8 airway, can that then lead to pulmonary edema?

9 A I answered that a couple questions ago. Most of the
10 time no. If there is some huge chunk of steak, perhaps,
11 that obstructs up high and the person is breathing against
12 that, then perhaps. But the obstruction has already
13 occurred by the time aspiration is occurring.

14 Q Explain that. The obstruction has occurred by the time
15 somebody is aspirating, explain that.

16 A Well, your question was they've stopped breathing
17 completely, and what I'm describing is a specific
18 physiological issue that as someone is still breathing as
19 they die, they're creating that negative pressure that
20 causes pulmonary edema. Your question was apnea, which is
21 not breathing, thus hence they are not creating a negative
22 pressure.

23 Q So if somebody is struggling to breathe, say snoring or
24 that agonal breathing that you were discussing previously,
25 could that lead to that obstruction and pulmonary edema?

1 A Right. That's what we've been talking about today.

2 Q So yes?

3 A Yes.

4 Q I believe you testified a little bit about multiple
5 drug toxicity; is that correct?

6 A Correct.

7 Q Can alcohol exacerbate symptoms of multiple drug
8 toxicity?

9 A I'm sorry. Can you repeat that?

10 Q Can alcohol exacerbate symptoms of multiple drug
11 toxicity?

12 A Well, it depends on what drugs you're talking about.

13 Q Cocaine.

14 A Cocaine can, combined with alcohol, cause cocaethylene,
15 which was one of the substances. So that is cocaine plus
16 ethanol causes cocaethylene. So in that sense it can
17 enhance the effects of the cardiotoxicity of cocaine.

18 The alcohol does not necessarily cause someone to be
19 more sympathomimetic. In fact, to some degree, alcohol may
20 cause someone to come down from cocaine toxicity.

21 Q How about alcohol and Fentanyl?

22 A Alcohol could potentially enhance the respiratory
23 depressant effects, but the opioid has to be present. So,
24 for example, I'm going to use -- well, we'll use alcohol
25 since you asked it. Alcohol can certainly enhance

1 respiratory depression from an opioid, but you have to have
2 that opioid present to have that respiratory depression
3 enhanced. Because remember I said that alcohol does not
4 have significant respiratory depression in and of itself.
5 It may enhance it. It may enhance oxycodone. It may
6 enhance heroin. But in those situations, those are lower
7 potency opioids.

8 In a setting with Fentanyl, Fentanyl is so potent and a
9 stand-alone cause of death -- and all of these opioids are
10 stand-alone causes of death -- and you might enhance the
11 respiratory depression from the Fentanyl but, remember,
12 Fentanyl is 100 times more potent than morphine. And so to
13 say that alcohol enhances the respiratory depression of
14 Fentanyl is to say you have a shotgun wound to your heart,
15 which is the Fentanyl, and a pinprick hole to your heart,
16 which is the alcohol, and focusing in on that pinprick.

17 Q So the answer is yes, alcohol can increase those
18 effects, correct?

19 A And just like I explained --

20 Q It's a yes or no question, Dr. Hail.

21 A Subtly enhance.

22 Q Thank you.

23 What was the original use of Fentanyl?

24 A Well, as I described before, Fentanyl has been used
25 traditionally in medicine for pain.

1 Q What's a common dose for that?

2 A About 25 micrograms is what we would start with
3 intravenously.

4 Q Micrograms per what, liter?

5 A It's a dose, not a concentration.

6 Q Okay. So how would that show up in the blood work, the
7 original dose?

8 A If you give a 25 microgram dose of Fentanyl?

9 Q Uh-huh.

10 A I don't know.

11 Q You don't know what that number would look like?

12 A As I was saying, we don't send drug levels in the
13 medical setting because they don't mean anything. There are
14 certain references that you can look at that will show what
15 a 25 microgram dose might look like. The way it works is
16 you give the dose intravenously. It spikes high and then it
17 goes down low again. And those numbers can be quite a wide
18 range in living patients.

19 Q Is chronic opioid use a greater risk factor for
20 overdose?

21 A It can be. I mean, remember, you can use heroin one
22 time and die. You can use heroin for 25 years and die.

23 Q Is someone who has recently relapsed after coming clean
24 at greater risk for overdose?

25 A Perhaps. It depends on how long that they've been

1 clean.

2 It's interesting, your brain can start healing, for
3 lack of a better term, and lose its tolerance to some of
4 these drugs. And then yes, somebody who has been clean for
5 some length of time may use the dose they used to use and
6 have a tendency to overdose.

7 Q You work in an emergency medical setting at a hospital
8 most of the time, correct?

9 A Emergency department and the poison center.

10 Q And earlier you testified that you have a lot of
11 hands-on experience with patients, correct?

12 A Correct.

13 Q When you make a diagnosis, I believe it was your
14 testimony that you prefer to do those hands-on examinations,
15 correct?

16 A Correct.

17 Q For an individual who is drinking heavily, they
18 sometimes have an inability to protect their airway?

19 A If they are comatose from their drinking.

20 Q They lay down?

21 A If they reach levels like we talked about before, like
22 in a drinking game where they become comatose, then yes,
23 they cannot protect their airway.

24 Q That's why you place somebody in the recovery position
25 is because you don't want them to aspirate and they would be

1 able to better protect their airway, correct?

2 A Just in general or from alcohol?

3 Q In general.

4 A In general, if somebody is comatose and they're not
5 protecting their airway in the emergency department setting,
6 we would intubate them. We don't put them in the recovery
7 position.

8 Q If you were at your house drinking with a friend and
9 you were concerned that they may have overdone it but you
10 didn't want to take them to a hospital, would it be common
11 practice maybe for somebody to put them in a recovery
12 position?

13 A I don't know what the common practice is for that.

14 Q What is the recovery position, Dr. Hail?

15 A A recovery position is to put somebody on their side so
16 should they vomit or should they have any kind of secretions
17 from their airway, the fluids can roll out of their airway.

18 Q Can people who are long-term drug users have issues
19 with sleep apnea?

20 A Sleep apnea is a completely different process than
21 opioid toxicity.

22 Q Dr. Hail, that was not my question. I would ask that
23 you please respond to the question I'm asking you.

24 A Okay. Repeat your question.

25 Q Can chronic drug use create issues of sleep apnea?

1 A Not necessarily. That question doesn't make a lot of
2 sense.

3 Q Part of your testimony earlier is that pulmonary edema
4 is not specifically part of the toxidrome you've discussed;
5 is that correct?

6 A It is a consequence of the toxidrome, not a feature of
7 the toxidrome.

8 Q Because pulmonary edema can come from other things,
9 correct, than just opioid use?

10 A Right. There are a number of different physiological
11 mechanisms for pulmonary edema to occur.

12 Q Did you create a report in this case that was provided
13 to the government?

14 A Yes.

15 Q Are you familiar with the language in that report?

16 A Yes.

17 Q Do you remember in that report specifically stating
18 that drug concentrations must not be interpreted in a
19 vacuum?

20 A Correct.

21 Q Do you still believe that?

22 A Yes.

23 Q Do you also remember in that report where you quoted
24 that there's no defined lethal level for drugs?

25 A Correct.

1 Q Do you still believe that?

2 A Yes.

3 Q In your report you also stated that mixed drug
4 intoxication, as in this case, these opinions are
5 intellectually honest because most medical examiners do not
6 always have all the case specific details to elucidate which
7 drug was most responsible for causing the death. Do you
8 remember stating that?

9 THE COURT: You probably need to slow down.

10 MS. BECKETT: I apologize, Your Honor. I will. I
11 can restate that.

12 BY MS. BECKETT:

13 Q These opinions are intellectually honest because most
14 medical examiners do not always have all the case specific
15 details to elucidate which drug was most responsible for
16 causing the death. Do you remember stating that?

17 A Yes.

18 Q Do you still believe that?

19 A Yes.

20 Q You believe that you are more qualified to offer an
21 opinion than the doctor who actually medically examined the
22 body in this case?

23 A Sorry. You are really talking fast.

24 Q You believe that you are more qualified to give an
25 opinion on this issue than the doctor who examined the

1 alleged victim's body?

2 A Yes.

3 Q Do you remember stating in your report impairment,
4 intoxication, and cause of death are not determined by drug
5 concentrations alone?

6 A Yes.

7 Q Do you still believe that?

8 A Yes.

9 Q What is hypoventilation?

10 A Hypoventilation is a word. Hypo means low.
11 Ventilation means to breathe in and out. And so
12 hypoventilation is not just necessarily breathing slower,
13 but it is also ineffective respiration, that you are not
14 effectively breathing in and you are not effectively
15 breathing out.

16 Q Is that common with alcohol intoxication?

17 A It can be.

18 Q If you had a patient in your hospital who came in and
19 they were exhibiting signs of alcohol intoxication and
20 opioid use, or potential opioid overdose, would you only
21 treat the opioid symptoms?

22 A Yes.

23 Q You wouldn't treat anything for the alcohol
24 intoxication?

25 A There is no antidote for alcohol intoxication.

1 Q You wouldn't do anything to treat anything related to
2 the alcohol intoxication?

3 A Well, and please be fair. You understand that alcohol
4 intoxication is a very wide range of symptoms. Nine times
5 out of ten, the drunk, homeless guy that gets brought to me
6 in the emergency department just gets a bed to go sleep it
7 off, and we do absolutely nothing. So, you know, it depends
8 on what you mean. And if someone is coming in with alcohol
9 and an opioid, we're most concerned about the opioid because
10 that's what can potentially cause death, not the alcohol.

11 Q So if the hypoventilation is related to the alcoholism
12 and the opioids, you would only treat the opioids?

13 A Right, because in that situation that you're
14 describing, the opioid is what's causing the
15 hypoventilation. Hypoventilation and respiratory depression
16 are probably terms that could be used interchangeably.

17 Q I believe you stated that you were able to rule out all
18 other causes with the exception of Fentanyl in this case; is
19 that correct?

20 A Correct.

21 Q You did so without touching a victim?

22 A Correct.

23 Q Looking at a body?

24 A Correct.

25 Q I believe it was also your testimony that the cocaine

1 use of the victim was not a problem in this case?

2 A I didn't say it was not a problem. I said it was not
3 the but for cause of death.

4 Q So it had no impact in what he may or may not have been
5 experiencing?

6 A What I said was that he was not displaying signs and
7 symptoms of sympathomimetic toxicity.

8 Q I believe we also discussed a cutting agent that is not
9 FDA approved in the United States. I'm not going to say
10 that drug name because I will say it incorrectly, but I
11 believe it starts with an L.

12 A Well, truth be told, I may potentially be saying it
13 incorrectly as well. There is a bit of discussion amongst
14 ourselves in toxicology whether it's levamisole or
15 levamisole. So I won't hold you to it if you don't hold me
16 to it.

17 Q So it was also your testimony that the presence of that
18 particular non-FDA approved drug was not problematic or
19 causational of any of the effects or symptoms that the
20 alleged victim in this case was experiencing?

21 A Correct.

22 Q And the alcohol intoxication was also not problematic?

23 A Correct.

24 Q The prosecutor had you look at a photo of some
25 bedsheets in this case, and I won't bring that photo back

1 up. Did you examine those bedsheets yourself?

2 A No.

3 Q So you don't actually know what was on them, correct?

4 A I did not examine the bedsheets.

5 MS. BECKETT: If we could look at Government's
6 Exhibit 18.02. If I could have you just look at the blood
7 Fentanyl. If I could have you highlight that.

8 BY MS. BECKETT:

9 Q Do you see where it says potentially toxic, greater
10 than .010 micrograms per liter?

11 A Milligrams per liter, and yes, I see that.

12 Q Are you aware of what the actual levels were in this
13 case?

14 A .009.

15 Q Less than that?

16 A Yes.

17 Q What does effective level mean on here?

18 A I suppose by saying effective, that whoever created
19 this document is indicating some type of therapeutic level.
20 And as you can see from this range, this is what I was
21 saying before when I was asked about what the level would be
22 and I said I don't know. That .0003 to .010 is a wide range
23 over a huge exponential number of numbers. So I suspect
24 that in this particular case it is referring to what would
25 be considered therapeutic, and this is what we would say is

1 a wide therapeutic index. This is a huge range.

2 Q You don't have any other drug level on Mr. Kluyev, do
3 you, other than the .0009?

4 A I'm sorry. Can you repeat the question? I'm not sure
5 I understand what you're talking about.

6 Q There was not another drug level given for this
7 Fentanyl, correct? The only number we have is the .009.

8 A Right. This was sent on femoral blood.

9 Q I believe your testimony earlier, you used the phrase
10 not so much when asked whether or not edema occurs with a
11 cocaine death. Do you remember saying that?

12 A Yes.

13 Q But it has happened?

14 A I was referring to the activity of the metabolites.
15 The cocaine is what is active. The metabolites are not.

16 Q I don't believe that answered my question. I believe
17 what I asked you was has edema ever occurred with a cocaine
18 death?

19 A Not that you see very frequently. I can't say never
20 because there are situations where somebody who has
21 developed sympathomimetic toxicity and they may develop
22 acute heart failure because of the effects of the cocaine
23 could potentially develop pulmonary edema. It's a different
24 kind of pulmonary edema from a different kind of mechanism.

25 MS. BECKETT: Just a second, Your Honor.

1 THE COURT: Sure.

2 BY MS. BECKETT:

3 Q Did you review a document titled Verdict of the Coroner
4 in this case?

5 A Entitled what?

6 Q Verdict of the Coroner.

7 A I don't specifically recall a verdict of the coroner.

8 MS. BECKETT: Your Honor, if I may approach?

9 THE COURT: You may.

10 THE WITNESS: Oh, okay. Yes.

11 BY MS. BECKETT:

12 Q You're familiar with that?

13 A Yes.

14 Q What was the determination of the coroner in this case?

15 A It says that this death was due to multiple drug
16 intoxication.

17 Q Thank you.

18 MS. BECKETT: I have no further questions,
19 Your Honor.

20 THE COURT: Thank you, Ms. Beckett.

21 Mr. Gadd, redirect?

22 MR. GADD: Please.

23 REDIRECT EXAMINATION

24 BY MR. GADD:

25 Q There was a moment just a minute ago when you were

1 answering a question and you were cut off, and I did my best
2 to write it down. I think the question was something like
3 can chronic drug use create sleep apnea. It was the
4 question that didn't make a lot of sense. Do you remember
5 that question?

6 A Yes.

7 Q Can you explain the rest of what you were going to say,
8 why it didn't make sense?

9 A Well, sleep apnea is a disease entity just in and of
10 itself. And there are individuals who may have morbid
11 obesity. There may be individuals that have problems with
12 their brain centrally that can cause sleep apnea. And so
13 these individuals who have absolutely nothing to do with
14 drug toxicity or anything, just a completely different
15 thing, require those masks at night called the CPAP masks
16 that you might see like on TV, and that pushes the air in.
17 And so these people do have a type of obstruction that
18 causes them to snore, and it is snoring, and this positive
19 pressure opens up the airway so that they don't have that
20 obstruction when they're breathing.

21 But there is nothing specific to suggest that a chronic
22 drug user, in general, is going to develop sleep apnea over
23 time. That's not an appropriate causation discussion, which
24 is why I said that the question didn't make sense.

25 Q There was some discussion about how in a rare

1 circumstance like if someone had a big piece of steak, I
2 think was your term, that got caught in their throat, that
3 could create an obstruction that might mimic some of these
4 other effects, correct?

5 A Correct.

6 Q That's something that's looked for in an autopsy,
7 right?

8 A Right.

9 Q You talk about your methodology, and autopsy surgeons
10 have a methodology. They look for specific things like
11 that, correct?

12 A Correct. And there was no piece of steak or something
13 that was mentioned in the airways, which you would see in a
14 choking death. Of course, in a choking death, you are going
15 to typically have history from the people surrounding the
16 patient that said we were at a restaurant and then suddenly
17 they grabbed their neck, and no matter what we did, we
18 couldn't relieve the obstruction and they stopped breathing
19 and they died.

20 The important thing as a physician is we take a
21 history, and we obtain data. You don't just take one piece
22 of data in a vacuum. You have to make a reasonable
23 conclusion what the diagnosis is. And I make diagnoses
24 every single day, and cause of death is a diagnosis. But I
25 don't have to cut people open from stem to stern to make a

1 diagnosis. We take a history. We have imaging studies.
2 And, of course, the history is the most important part of
3 coming up with a diagnosis.

4 Q We've been looking at the toxicology results signed by
5 one of our prior witnesses, Mr. Bill Posey, who has a
6 bachelor's degree and a science major, although I can't
7 remember which. In referring to those types of results,
8 you've said a phrase I want to ask you about, levels don't
9 mean much in a living patient, and I think you've said they
10 mean even less in a deceased patient.

11 A Yes.

12 Q Can you kind of explain why that's the case.

13 A Yes. This is an important thing to understand because
14 as we are all sitting here living, our heart is pumping, and
15 so our blood is mixing all around our body. So it is
16 homogenous. It should be the same. So if I draw a drug
17 level from a scalp vein, or from your subclavian vessel
18 right here, or straight into your heart, or in your femoral
19 vessel, or in your toe vein, in a living person, those
20 numbers should all be close to the same within laboratory
21 error.

22 But in a dead person, the heart has stopped, and that
23 blood is no longer mixing. And so the blood just pools in
24 the gravity locations. That's lividity. That's why
25 whenever you see pictures of dead bodies, they're purple on

1 the underside of their body, if they're laying on their back
2 of course.

3 So part of dying is the putrefaction process. When you
4 die, your cells die and those cells burst open. That's
5 called autolysis. Whatever is inside those cells comes out
6 wherever it is. So drugs don't just hang out in the blood.
7 They cross the blood-brain barrier into the brain. They go
8 into tissue. They go into fat.

9 So essentially wherever you draw blood in a dead
10 patient, using my prior example, like the scalp, or the toe,
11 or the heart, you're going to get different answers for that
12 number, which is part of the reason why you don't hang your
13 hat on the number. Because if in this case Ruslan's femoral
14 level was .009, but if it had been drawn from somewhere
15 else, you might have had a completely different number. You
16 could potentially have a wide range of numbers. So that's
17 why it is not appropriate to rely on that one number, but
18 for sure that Fentanyl is there.

19 MR. GADD: Nothing further. Thank you.

20 THE COURT: Thank you.

21 Recross, Ms. Beckett?

22 MS. BECKETT: No further questions, Your Honor.

23 THE COURT: Thank you.

24 Thank you. You may step down.

25 We'll take our first break. We'll be in recess

1 for about 20 minutes.

2 (Whereupon, proceedings not transcribed.)

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C E R T I F I C A T E

I hereby certify that the foregoing matter is
transcribed from the stenographic notes taken by me and is a
true and accurate transcription of the same.

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